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OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C.
1940 DUKE STREET
ALEXANDRIA, VA 22314

EXAMINER	
NGUYEN, TOAN D	

ART UNIT	PAPER NUMBER
2416	

NOTIFICATION DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentdocket@oblon.com
oblonpat@oblon.com
jgardner@oblon.com

Office Action Summary	**Application No.** 10/731,156	**Applicant(s)** YASUKAWA ET AL.	
	Examiner TOAN D. NGUYEN	**Art Unit** 2416	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 December 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-13* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-13* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *10 December 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims1-13 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 112

2. Claims 1-13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites the limitation "the maximum value and the minimum value" in lines 9-10. There is insufficient antecedent basis for this limitation in the claim. Similar problems exist in claim 3, lines 14-15; claim 5, lines 11-12; claim 10, line 12; and claim 12, line 12.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was

not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 1-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Juttner et al. (US 7,020,086) in view of Sheu et al., (IEEEICC, page 611-618, “A Fast and Efficient Heuristic Algorithm for the Delay-And Delay Variation Bound Multicast Tree Problem”, 2001).

For claims 1-2, Juttner et al. disclose Lagrange quality of service routing, comprising the steps of:

obtaining minimum delay paths from the source node (figure 2, reference S) to each of the destination nodes (figure 2, reference T) using topology information and delay information of the network (col. 3, lines 3-9);

selecting candidate nodes of a rendezvous point node only from nodes on one of the obtained minimum delay paths (figure 2, reference C, col. 3, lines 9-11);

selecting, as the rendezvous point node, the candidate node for which the difference is smallest among differences for all of the candidate nodes (figure 2, reference S-C, col. 3, lines 9-11); and

outputting, as the multicast paths, a minimum delay path from the source node (figure 2, reference S) to the rendezvous point node (figure 2, reference S-C, col. 3, lines 9-10) and minimum delay paths from the rendezvous point node (figure 2, reference C) to each destination node (figure 2, reference C-Z, col. 3, lines 10-11).

However, Juttner et al. do not expressly disclose for each of the candidate nodes, calculating minimum delay paths from the candidate node to each of the destination nodes, and obtaining a difference between the maximum value and the minimum value among delays of the calculated minimum delay paths. In an analogous art, Sheu et al. disclose for each of the candidate nodes, calculating minimum delay paths from the candidate node to each of the destination nodes, and obtaining a difference between the maximum value and the minimum value among delays of the calculated minimum delay paths (page 613, lines 22-27).

Sheu et al. disclose wherein the minimum delay path on which the candidate nodes exist is one having maximum delay among minimum delay paths from the source node to each of the destination nodes (page 612, line 35-43 as set forth in claim 2).

One skilled in the art would have recognized the for each of the candidate nodes, calculating minimum delay paths from the candidate node to each of the destination nodes, and obtaining a difference between the maximum value and the minimum value among delays of the calculated minimum delay paths, and would have applied Sheu et al.'s multicast delay variation in Juttner et al.'s least delay link. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention, to use Sheu et al.'s a fast and efficient heuristic algorithm for the delay-and delay variation bound multicast tree problem in Juttner et al.'s Lagrange quality of service routing with the motivation being to provide the difference of the maximum end-to-end delay and the minimum end-to-end delay among the paths from the source node to all the destination nodes has to be kept within delta (page 613, lines 24-27).

For claim 3, Juttner et al. disclose Lagrange quality of service routing, comprising the steps of:

obtaining minimum delay paths from the source node (figure 2, reference S) to each of the destination nodes (figure 2, reference T) using topology information and delay information of the network (col. 3, lines 3-9);

selecting candidate nodes of a rendezvous point node only from nodes on one of the obtained minimum delay paths (figure 2, reference C, col. 3, lines 9-11);

selecting, as the rendezvous point node, the candidate node for which the difference is smallest among differences for all of the candidate nodes (figure 2, reference S-C, col. 3, lines 9-11); and

outputting, as the multicast paths, a minimum delay path from the source node (figure 2, reference S) to the rendezvous point node (figure 2, reference S-C, col. 3, lines 9-10) and minimum delay paths from the rendezvous point node (figure 2, reference C) to each destination node (figure 2, reference C-Z, col. 3, lines 10-11); and

wherein the multicast communication path calculation apparatus sends the output results to the multicast communication path setting apparatus, and the multicast communication path setting apparatus establishes the multicast paths according to the output results (figure 2, col. 3, lines 9-14).

However, Juttner et al. do not expressly disclose for each of the candidate nodes, calculating minimum delay paths from the candidate node to each of the destination nodes, and obtaining a difference between the maximum value and the minimum value among delays of the calculated minimum delay paths. In an analogous

art, Sheu et al. disclose for each of the candidate nodes, calculating minimum delay paths from the candidate node to each of the destination nodes, and obtaining a difference between the maximum value and the minimum value among delays of the calculated minimum delay paths (page 613, lines 22-27).

One skilled in the art would have recognized the for each of the candidate nodes, calculating minimum delay paths from the candidate node to each of the destination nodes, and obtaining a difference between the maximum value and the minimum value among delays of the calculated minimum delay paths, and would have applied Sheu et al.'s multicast delay variation in Juttner et al.'s least delay link. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention, to use Sheu et al.'s a fast and efficient heuristic algorithm for the delay-and delay variation bound multicast tree problem in Juttner et al.'s Lagrange quality of service routing with the motivation being to provide the difference of the maximum end-to-end delay and the minimum end-to-end delay among the paths from the source node to all the destination nodes has to be kept within delta (page 613, lines 24-27).

For claim 4, Juttner et al. disclose wherein each node in the network measures traffic state of the network and sends the measurement results to the multicast communication path calculation apparatus, and the multicast communication path calculation apparatus calculates the multicast paths according to the measurement results (figure 2, col. 3, lines 9-14).

For claims 5-7, Juttner et al. disclose Lagrange quality of service routing, comprising the steps of:

a part configured to obtain minimum delay paths from the source node (figure 2, reference S) to each of the destination nodes (figure 2, reference T) using topology information and delay information of the network (col. 3, lines 3-9);

a part configured to select candidate nodes of a rendezvous point node only from nodes on one of the obtained minimum delay paths (figure 2, reference C, col. 3, lines 9-11);

a part configured to select, as the rendezvous point node, the candidate node for which the difference is smallest among the differences for all of the candidate nodes (figure 2, reference S-C, col. 3, lines 9-11); and

a part configured to output results comprising, as the multicast paths, a minimum delay path from the source node (figure 2, reference S) to the rendezvous point node (figure 2, reference S-C, col. 3, lines 9-10) and minimum delay paths from the rendezvous point node (figure 2, reference C) to each of the destination nodes (figure 2, reference C-Z, col. 3, lines 10-11).

However, Juttner et al. do not expressly disclose a part configured to calculate, for each of the candidate nodes, minimum delay paths from the candidate node to each of the destination nodes, and obtain, for each of the candidate nodes, a difference between the maximum value and the minimum value among delays of the calculated minimum delay paths. In an analogous art, Sheu et al. disclose a part configured to calculate, for each of the candidate nodes, minimum delay paths from the candidate node to each of the destination nodes, and obtain, for each of the candidate nodes, a

difference between the maximum value and the minimum value among delays of the calculated minimum delay paths (page 613, lines 22-27).

Sheu et al. disclose wherein the minimum delay path on which the candidate nodes exist is one having maximum delay among minimum delay paths from the source node to each of the destination nodes (page 612, line 35-43 as set forth in claim 6); and a part configured to receive the topology information and the delay information of the network (section 3.2. A format description of DDVCA, page 614, lines 2-9); and a part configured to store the received information in a recording medium, wherein the multicast communication path calculation apparatus calculates the multicast paths by reading the received information from the recording medium (section 3.2. A format description of DDVCA, page 614, line 10 to second column, line 5 as set forth in claim 7).

One skilled in the art would have recognized the part configured to calculate, for each of the candidate nodes, minimum delay paths from the candidate node to each of the destination nodes, and obtain, for each of the candidate nodes, a difference between the maximum value and the minimum value among delays of the calculated minimum delay paths, and would have applied Sheu et al.'s multicast delay variation in Juttner et al.'s least delay link. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention, to use Sheu et al.'s a fast and efficient heuristic algorithm for the delay-and delay variation bound multicast tree problem in Juttner et al.'s Lagrange quality of service routing with the motivation being to provide the difference of the maximum end-to-end delay and the minimum end-to-end delay

among the paths from the source node to all the destination nodes has to be kept within delta (page 613, lines 24-27).

For claim 8, Juttner et al. disclose further comprising a part configured to include the output results in a multicast path setting control message, and send the multicast path setting control message over the multicast paths indicated by the output results (figure 2, col. 3, lines 9-14).

For claim 9, Juttner et al. disclose further comprising:

a part configured to receive a request to calculate the multicast paths from a multicast communication path setting apparatus ;and

a part configured to send the output results to the multicast communication path setting apparatus (figure 2, col. 3, lines 9-14).

For claims 10-11, Juttner et al. disclose Lagrange quality of service routing, comprising the steps of:

program code means for obtaining minimum delay paths from the source node (figure 2, reference S) to each of the destination nodes (figure 2, reference T) using topology information and delay information of the network (col. 3, lines 3-9);

program code means for selecting candidate nodes of a rendezvous point node only from nodes on one of the obtained minimum delay paths (figure 2, reference C, col. 3, lines 9-11);

program code means for selecting, as the rendezvous point node, the candidate node for which the difference is smallest among differences for all of the candidate nodes (figure 2, reference S-C, col. 3, lines 9-11); and

program code means for outputting, as the multicast paths, a minimum delay path from the source node (figure 2, reference S) to the rendezvous point node (figure 2, reference S-C, col. 3, lines 9-10) and minimum delay paths from the rendezvous point node (figure 2, reference C) to each destination node (figure 2, reference C-Z, col. 3, lines 10-11).

However, Juttner et al. do not expressly disclose program code means for calculating, for each of the candidate nodes, calculating minimum delay paths from the candidate node to each of the destination nodes, and obtaining a difference between the maximum value and the minimum value among delays of the calculated minimum delay paths. In an analogous art, Sheu et al. disclose program code means for calculating, for each of the candidate nodes, calculating minimum delay paths from the candidate node to each of the destination nodes, and obtaining a difference between the maximum value and the minimum value among delays of the calculated minimum delay paths (page 613, lines 22-27).

Sheu et al. disclose wherein the minimum delay path on which the candidate nodes exist is one having maximum delay among minimum delay paths from the source node to each of the destination nodes (page 612, line 35-43 as set forth in claim 11).

One skilled in the art would have recognized the program code means for calculating, for each of the candidate nodes, calculating minimum delay paths from the candidate node to each of the destination nodes, and obtaining a difference between the maximum value and the minimum value among delays of the calculated minimum delay paths, and would have applied Sheu et al.'s multicast delay variation in Juttner et

al.'s least delay link. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention, to use Sheu et al.'s a fast and efficient heuristic algorithm for the delay-and delay variation bound multicast tree problem in Juttner et al.'s Lagrange quality of service routing with the motivation being to provide the difference of the maximum end-to-end delay and the minimum end-to-end delay among the paths from the source node to all the destination nodes has to be kept within delta (page 613, lines 24-27).

For claims 12-13, Juttner et al. disclose Lagrange quality of service routing, comprising the steps of:

program code means for obtaining minimum delay paths from the source node (figure 2, reference S) to each of the destination nodes (figure 2, reference T) using topology information and delay information of the network (col. 3, lines 3-9);

program code means for selecting candidate nodes of a rendezvous point node only from nodes on one of the obtained minimum delay paths (figure 2, reference C, col. 3, lines 9-11);

program code means for selecting, as the rendezvous point node, the candidate node for which the difference is smallest among differences for all of the candidate nodes (figure 2, reference S-C, col. 3, lines 9-11); and

program code means for outputting, as the multicast paths, a minimum delay path from the source node (figure 2, reference S) to the rendezvous point node (figure 2, reference S-C, col. 3, lines 9-10) and minimum delay paths from the rendezvous

point node (figure 2, reference C) to each destination node (figure 2, reference C-Z, col. 3, lines 10-11).

However, Juttner et al. do not expressly disclose program code means for calculating, for each of the candidate nodes, calculating minimum delay paths from the candidate node to each of the destination nodes, and obtaining a difference between the maximum value and the minimum value among delays of the calculated minimum delay paths. In an analogous art, Sheu et al. disclose program code means for calculating, for each of the candidate nodes, calculating minimum delay paths from the candidate node to each of the destination nodes, and obtaining a difference between the maximum value and the minimum value among delays of the calculated minimum delay paths (page 613, lines 22-27).

Sheu et al. disclose wherein the minimum delay path on which the candidate nodes exist is one having maximum delay among minimum delay paths from the source node to each of the destination nodes (page 612, line 35-43 as set forth in claim 13).

One skilled in the art would have recognized the program code means for calculating, for each of the candidate nodes, calculating minimum delay paths from the candidate node to each of the destination nodes, and obtaining a difference between the maximum value and the minimum value among delays of the calculated minimum delay paths, and would have applied Sheu et al.'s multicast delay variation in Juttner et al.'s least delay link. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention, to use Sheu et al.'s a fast and efficient heuristic algorithm for the delay-and delay variation bound multicast tree problem in Juttner et

al.'s Lagrange quality of service routing with the motivation being to provide the difference of the maximum end-to-end delay and the minimum end-to-end delay among the paths from the source node to all the destination nodes has to be kept within delta (page 613, lines 24-27).

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to TOAN D. NGUYEN whose telephone number is (571)272-3153. The examiner can normally be reached on M-F (7:00AM-4:30PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William Trost can be reached on 571-272-7872. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/T. D. N./
Examiner, Art Unit 2416

/William Trost/
Supervisory Patent Examiner, Art Unit 2416